

DETAILED ACTION

Status of Application

Applicants' arguments/remarks and amendment filed December 24, 2009, have been carefully considered. **Claims 29, 30, 34, 36-47, 49 and 52-76** are pending in the instant application, with **Claims 29, 30, 36, 39-42, 46, 47, 49, 52, 57, 58, 65, 67-69, 73 and 74** amended and **Claim 76** added. **Claims 1-28, 31-33, 35, 48, 50 and 51** have been cancelled. **Claims 29, 30, 34, 36-47, 49 and 52-76** have been examined.

Claim Rejections - 35 USC § 102/103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. **Claims 69-75** are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Neudecker et al. (US 2004/0048157 A1), as applied in the previous Office action.
3. **Claims 29, 30, 34, 39, 47, 49, 52-54, 56-58, 60, 65-67, 69-71, 73, 75 and 76** are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Stoker et al. (US 2004/0013943 A1) (newly cited).
4. With regard to **Claims 29, 30, 34, 39, 57 and 58**, Stoker discloses a process for the preparation of LiFePO_4 comprising following steps: a) an organic complex of iron in an oxidation state greater than 2 is brought into contact with Li_2HPO_4 and with an entity

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of formula $H_b(XO_4)$, where X is chosen from the group consisting of Si, S, P, Ge and As, and b has a value from 0 to 5, in a liquid medium (organic solvents, water, or mixtures thereof) in a closed chamber; the chamber is brought to a temperature T which makes possible the decomposition of the organic complex in the liquid medium; and b) the temperature and pressure in the chamber are brought back to ambient temperature and atmospheric pressure and the $LiFePO_4$ is recovered (Stoker, Abstract; 0001-0002; 0007; 0011-0012; 0014-0019; 0021-0022; 0024; 0026; 0028-0031; 0052; 0066; 0072; 0077-0086; 0089-0092; 0111-0112; 0118-0119; 0139; Claims 1 and 3-6).

5. With regard to **Claims 47, 52-54, 67, 69-71, 73 and 75**, Stoker discloses particulate $LiFePO_4$ in an electrode active material that is in a positive electrode that is in a battery (Stoker, Abstract; 0001-0002; 0007; 0011-0012; 0014-0019; 0021-0022; 0024; 0026; 0028-0031; 0052; 0066; 0072; 0077-0086; 0089-0092; 0111-0112; 0118-0119; 0139; Claims 1 and 3-6). Stoker does not explicitly disclose the insertion compound containing less than 5% (**Claim 47**) or 1% (**Claim 76**) by weight metal M in an oxidation state greater than 2 (**Claims 47 and 76**); the $LiFePO_4$ particles exhibiting fully controlled homogeneous morphology (**Claim 47**); the deviation from the mean value of the size of the particles being less than 20% (**Claim 47**), 10% (**Claim 65**), or 1% (**Claim 66**); the particles in the shape of cylinders, cubes or polyhedra (**Claim 49**); nor an electrochromic device (**Claims 56 and 75**).

6. With regard to **Claims 47 and 76**, Stoker does not disclose the presence of any iron in an oxidation state greater than 2 after the production of $LiFePO_4$ is complete,

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thus the LiFePO_4 of Stoker would be expected to contain 0% by weight iron in an oxidation state greater than 2.

7. With regard to **Claims 47, 65, and 66**, in the absence of a teaching of deviation from the mean value of particle size, the deviation would be expected to be 0%. In any event, Stoker discloses the same production process as that of the instant application and thus, the process of Stoker would inherently produce LiFePO_4 particles with a deviation from the mean value of the size of the particles being less than 20%, 10% or 1%.

8. Further with regard to **Claim 47**, Stoker discloses the same production process as that of the instant application and thus, the process of Stoker would inherently produce LiFePO_4 particles exhibiting fully controlled homogeneous morphology.

9. With regard to **Claims 56 and 75**, the recitation electrochromic device has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951). As written, **Claims 56 and 75** only necessitate the insertion compound (LiFePO_4). Thus, Stoker anticipates these claims. In any event, the LiFePO_4 of Stoker would inherently be capable of serving as an electrochromic device since Stoker discloses the claimed insertion compound and production process.

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10. With regard to **Claim 49**, while Stoker does not explicitly disclose the particles in the shape of cylinders, cubes or polyhedra, Stoker discloses the same production process as that of the instant application and thus, the process of Stoker would inherently produce at least some LiFePO_4 particles in the shape of cylinders, cubes or polyhedra.

11. With regard to **Claim 60**, Stoker discloses liquid alkanes (Stoker, 0066; 0077).

12. **Claims 29, 30, 34, 39, 47, 49, 52-54, 56-58, 60, 65-67, 69-71, 73, 75 and 76** are also obvious over Stoker because anticipation is the epitome of obviousness.

Claim Rejections - 35 USC § 103

13. **Claim 40** is rejected under 35 U.S.C. 103(a) as being unpatentable over Stoker et al. (US 2004/0013943 A1) (newly cited) as applied to **Claim 29** above.

14. With regard to **Claim 40**, Stoker discloses drying the LiFePO_4 (Stoker, Abstract; 0001-0002; 0007; 0011-0012; 0014-0019; 0021-0022; 0024; 0026; 0028-0031; 0052; 0066; 0072; 0077-0086; 0089-0092; 0111-0112; 0118-0119; 0139; Claims 1 and 3-6).

15. Stoker does not disclose washing or drying under vacuum (**Claim 40**); however, doing such is conventional in the art in order to obtain a product with minimal impurities and thus, would have been obvious to one of ordinary skill in the art at the time of invention.

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16. **Claims 36-38, 40-46, 59 and 61-64** are rejected under 35 U.S.C. 103(a) as obvious over Stoker et al. (US 2004/0013943 A1) (newly cited) as applied to **Claims 29, 47 and 60** above, and further in view of Bridson et al. (*Chem. Mater.*) (of record).

17. Stoker does not disclose the organic complex limitations of **Claims 36-38, 41-45, 59 and 62**. With regard to **Claims 36-38 and 59**, Bridson discloses a process for the preparation of NaFePO_4 comprising following steps: a) iron nitrilotriacetate is brought into contact with NaHPO_4 in water in a closed chamber; the chamber is brought to a temperature T which makes possible the decomposition of the organic complex in the water; b) the chamber is cooled; and the NaFePO_4 is recovered (Bridson, p. 764, "Experimental Section;" p. 765, 1st column, "Syntheses of Maricite;" p. 766, "Crystal Structures" and "Discussion;" Tables 1 and 2; p. 767, 1st column). With regard to **Claims 41-46 and 62**, Bridson discloses the iron nitrilotriacetate prepared in a step prior to step a) by bringing ammonium ferric sulfate into contact with nitrilotriacetic acid in water (Bridson, p. 764, "Experimental Section"). It is well-known in the art that lithium and sodium insertion compounds are obvious variants when used in batteries, as evidenced by Stoker (Stoker, 0004). Thus, it would have been obvious to one of ordinary skill in the art to try to modify the product and process disclosed by Stoker with the organic transition metal complexes as taught by Bridson because one of ordinary skill in the art could have pursued the known potential transition metal complex options useful for insertion compound synthesis within his or her technical grasp with a reasonable expectation of success.

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18. With regard to **Claim 40**, Stoker discloses drying the LiFePO_4 (Stoker, Abstract; 0001-0002; 0007; 0011-0012; 0014-0019; 0021-0022; 0024; 0026; 0028-0031; 0052; 0066; 0072; 0077-0086; 0089-0092; 0111-0112; 0118-0119; 0139; Claims 1 and 3-6). Stoker does not disclose washing or drying under vacuum (**Claim 40**); however, Bridson discloses the insertion compound of an alkali metal washed after step b) in a suction filter (Bridson, p. 765, 1st column, "Syntheses of Maricite"). The insertion compound would inherently be dried by washing with ethanol in a suction filter.
19. With regard to **Claim 46**, Stoker discloses the liquid medium being organic solvents, water, or mixtures thereof (Stoker, 0066; 0077).
20. With regard to **Claim 63**, Stoker discloses liquid alkanes (Stoker, 0066; 0077).
21. The aforementioned applied art does not explicitly disclose the liquid alkanes being dodecane or tributyl phosphate (TBP) (**Claims 61 and 64**). With regard to **Claims 61 and 64**, choosing an organic solvent would have been a matter of process design and optimization and thus, obvious to one of ordinary skill in the art. Further, liquid alkanes such as dodecane and tributyl phosphate are well known organic solvents in the art, and thus would have been obvious variants of the organic solvents (including liquid alkanes), water, or mixtures thereof of the aforementioned applied art.
22. **Claims 55, 56, 68, 72, 74 and 75** are rejected under 35 U.S.C. 103(a) as obvious over Stoker et al. (US 2004/0013943 A1) (newly cited) as applied to **Claims 29, 47, 52-54, and 69-71** above, and further in view of Neudecker et al. (US 2004/0048157 A1) (of record).

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23. Stoker does not disclose a negative electrode based on $\text{Li}_4\text{Ti}_5\text{O}_{12}$ (**Claims 55 and 72**); LiMn_2O_4 (**Claims 68 and 74**); nor an electrochromic device comprising LiFePO_4 (**Claims 56 and 75**).

24. With regard to **Claims 68 and 74**, Neudecker discloses a battery comprising a positive electrode comprising an active material comprising LiFePO_4 (Neudecker, 0059, 0068, 0113; Claims 50, 106 and 11). Neudecker further discloses blends of active materials may be used in the cathodes, potential additional active materials including LiCoO_2 , LiNiO_2 , LiFePO_4 , and LiMn_2O_4 (Neudecker, 0059, 0068, 0113; Claims 50, 106 and 11).

25. With regard to **Claims 55 and 72**, Neudecker discloses the battery further comprising a negative electrode based on $\text{Li}_4\text{Ti}_5\text{O}_{12}$ (Neudecker, 0046 and 0112; Claim 22).

26. With regard to **Claims 56 and 75**, Neudecker discloses an electrochromic device comprising LiFePO_4 (Neudecker, 0126; Claims 78 and 79).

27. Thus, it would have been obvious to one of ordinary skill in the art to try to modify the product and process disclosed by Stoker with the uses as taught by Neudecker because one of ordinary skill in the art could have pursued the known potential insertion compound use options within his or her technical grasp with a reasonable expectation of success.

Response to Amendment

The amendment to the Claims submitted December 24, 2009, has been carefully considered and is accepted. The objections to the Claims and the 35 U.S.C. 112 rejections of the previous Office action have been withdrawn.

Response to Arguments

28. Applicants' arguments filed December 24, 2009, with respect to **Claims 29-68 and 76** have been fully considered and are persuasive in view of Applicants' amendment filed December 24, 2009. The corresponding rejections have been withdrawn.

29. Acknowledgment is made of Applicants' December 24, 2009, submission of a translation of foreign priority document, FR 02/15915. In view of said translation submission, the rejection over Franger has been withdrawn.

30. Applicants' arguments filed December 24, 2009, with respect to Bridson, Barker and Munshi have been fully considered and are persuasive in view of Applicants' amendment filed December 24, 2009. The corresponding rejections have been withdrawn.

31. Applicants' arguments filed December 24, 2009, with respect to the rejection of **Claims 69-75** over Neudecker have been fully considered but are not persuasive. While **Claim 69** references **Claim 29** in its preamble, **Claim 69** is a product-by-process claim and does not require the detailed process limitations of **Claim 29**. **Claims 69-75** are product-by-process claims. The product is held to be obvious, when the reference

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teaches a product that appears to be the same as, or an obvious variant of, the product set forth in a product-by-process claim although produced by a different process. See *In re Marosi*, 710 F.2d 799, 218 USPQ 289 (Fed. Cir. 1983), and *In re Thorpe*, 777 F.2d 695, 227 USPQ 964 (Fed. Cir.1985). See also MPEP 2113.

Conclusion

32. Applicants' amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicants are reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BRITTANY M. MARTINEZ whose telephone number is (571) 270-3586. The examiner can normally be reached Monday-Friday 9:00AM-5:30PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached at (571) 272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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